

Entering into Space and New Energy and Propulsion Technology (7)

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DESIGN AND DEVELOPMENT OF P35 SOLID ROCKET MOTOR FOR LONG MARCH 11 LAUNCH VEHICLE

Abstract

P35 is the first stage solid rocket motor of the Long March 11 launch vehicle, which is China's first four-stage solid launcher. The outside diameter of P35 is 2 meters and the mass of propellant reaches 35 tons. The motor, which was developed by the Forth Academy of China Aerospace Science and Technology Corporation since 2010, gives an average thrust of 1176kN, in 71 seconds. During the development of P35, a number of key technologies have been overcome, including the analysis of the structural integrity of a large grain. As the first stage solid rocket motor, P35 demonstrated excellent performance in the first flight test of the Long March 11, on September 25, 2015. This paper reviews the development process of P35 and gives an introduction about of P35's structures and new technologies adopted in details. The tests to investigate performance parameters are also analyzed. In order to enhance the carrying capacity of the Long March 11 launch vehicle, P35 motor will be optimized, some details of the improvement have been given in the last part of the paper.